Link between magnetic susceptibility and environmental changes in Late Pliocene-Quaternary lacustrine sediments of the Qaidam Basin (NE Tibetan Plateau)

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A multi-proxy approach (including magnetic proxies, palynology, geochemistry and sedimentology) on the ~940-m-long drill core SG-1 from the western Qaidam Basin on the NE part of the Tibetan Plateau reveals the climate evolution during the late Pliocene-Quaternary (~2.8 Ma to 0.1 Ma). Especially magnetic susceptibility (χ) shows to bear a response to past climate detected (i) by analysing magnetic mineralogy and magnetic grain sizes, (ii) by searching for orbital cycles, and (iii) by comparing χ to palynological results. For the comparison of χ to pollen concentrations, we use the *Artemisia*/Chenopodiaceae (A/C) ratio as an indicator of moisture availability on 41 samples spanning the Mid-Pleistocene Transition (MPT; ~1 Ma) and another 40 samples along the entire core at particularly pronounced minima and maxima values of χ. Our results indicate that less dry phases (higher A/C ratio) correlate with low χ, whereas drier phases with high χ. The strong correlation of χ and the palynological results manifest the response of χ to climate change (notably moisture) and demonstrate the value of χ as a key parameter for high-resolution paleoclimate analysis in the Qaidam Basin.

Key words: Magnetic proxies; Pollen; Lacustrine sediments; Paleoclimate; Qaidam Basin; Tibetan Plateau